



Accelerating Self Supply

A Case Study from Ethiopia 2010



Executive Summary

With 40 million or more rural people without access to safe water, Ethiopia is faced with a major challenge to reach the Universal Access Plan targets (98% coverage by 2012) or even the MDG target (52% coverage by 2015). At the same time there have already been mass campaigns to encourage household investment in rainwater harvesting for irrigation and well-digging. As a result, the government is keen to adopt the concepts of low-cost solutions and Self Supply and is exploring the best ways to do so.

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Abbreviations

DfiD	Department for International Development (UK)
DHS	Demographic Health Survey
DRC	Democratic Republic of Congo
IEC	Information, Education and Communication
HDI	Human Development Index
HWTS	Household water treatment and storage
JICA	Japanese International Cooperation Agency
JMP	Joint Monitoring Programme (WHO/ UNICEF)
MDG	Millennium Development Goal
MoWR	Ministry of Water Resources
NGO	Non-government Organisation
PASDEP	Plan for the Accelerated and Sustained Development to End Poverty
PSI	Population Services International
RWSN	Rural Water Supply Network
TVC	Training and Vocational College
UAP	Universal Access Plan
UNDP	United Nations Development Programme
UNICEF	United Nations Children's Fund
WASH	Water, sanitation and hygiene
WSP	Water and Sanitation Programme (World Bank)

Conventional community supply refers to heavily subsidised water supply services which are implemented by Governments and NGOs and then managed by communities.

The Self Supply Approach

Supported Household Investment in Water Supply

Approximately one billion people around the world do not have access to a safe and reliable water supply at a reasonable distance from their home. Many more consider their existing water supply to be inadequate in terms of quality, quantity, reliability or convenience. Consequently, increasing numbers of households have improved their own water supply in small and affordable steps using their own resources. Their capacity to do so, and the advantages this may bring, are seldom recognised or built upon.

Supplies that have been improved with household investment tend to be more effectively managed and maintained. They are particularly relevant in small or remote communities, and where there is easy access to groundwater or plentiful rainwater. In such conditions, conventional community water supplies tend to result in high per capita costs combined with low sustainability, and so often to lead to low coverage.

Under the Self Supply flagship, the Rural Water Supply Network (RWSN) is working with authorities, NGOs and the private sector to recognise that many households and small groups can actually construct or pay for the construction of wells and rainwater harvesting facilities. Households can also improve water quality by upgrading existing water sources or undertaking household water treatment, or a combination of the two. Many are showing the demand for such improvements but also the constraints which they face in achieving their aims.

To enable and encourage them to make such investments, four supporting pillars are required (Sutton 2009):

- Technology and technical advice for consumers
- A developed private sector
- Access to micro-credit or savings mechanisms
- Policies which encourage individual initiatives

The overarching aim of piloting initiatives in the four countries of Ethiopia, Mali, Uganda and Zambia is the establishment of these pillars to create an enabling environment and, ultimately, taking the Self Supply approach to scale.

This report is the second in a set of five. Four of these reports present progress in countries (Ethiopia, Mali, Uganda and Zambia) which have been piloting Self Supply. The fifth report draws together the lessons from these projects.

Country Context

Geography, Geology and Population

Ethiopia covers an area of some one million square kilometres and is land-locked. About 10% of the land is arable, and a further 100,000km² is covered by surface water, including numerous rivers and Lake Tana, the source of the Blue Nile. The country is bisected by the Great Rift Valley, with plateaux and highlands to either side.

Average annual rainfall in Ethiopia is 848 mm, varying from about 2,000 mm in some pockets of the southwest to less than 100 mm in the Afar Lowlands in the northeast. Rainfall is highly erratic, and most rain falls at high intensity, with extreme spatial and temporal variability (FAO 2005).



Figure 1: Map of Ethiopia

The British Geological Survey map of Water Security and Drought (BGS 2001) identifies Afar and Somali as the most drought-prone areas in the country, and also as having widespread brackish water aquifers. Droughts have been a regular feature in Ethiopia but tend not to affect all regions at the same time.

According to data from the Joint Monitoring Programme (WHO/UNICEF 2010), Ethiopia's population in 2008 was 81 million, of which 70 million were rural. The average population density in Ethiopia (70 persons/km²) is relatively high for sub-Saharan Africa. The livestock population is also high. It is estimated that livestock supports and sustains the livelihoods of about 80% of the rural poor (FAO 2005). Life expectancy, at 55 years, is the highest of the four Self Supply piloting countries (UNICEF 2010).

Economics

Agriculture is the main foundation of the Ethiopian economy and employs about 80% of the population (FAO 2005). Productivity, however, is low, even in comparison to other comparable countries (Bachewe 2009). Coffee is the main export crop, and over the past ten years, the Ethiopian economy has been the fastest growing (non-oil-producing) country in Africa (IMF 2009). The country is a major maize producer and also exports large quantities of qat.

Ethiopia is 171 out of 182 in the Human Development Index (HDI) ranking (UNDP 2009). Unlike Zambia and Mali, however, most people have risen above the very poorest level, with only

39% earning less than 1.25 dollars a day. Most Ethiopians fall in the next range, with 78% of the population on less than \$2/ day (UNDP 2009). Land is owned by government for the people, so all land is leasehold (FAO 2005), which may pose some constraint on large-scale and long-term private investment

Rural Water Supply – a Change in Emphasis

Government states that access to improved water supplies in Ethiopia at the end of 2008 was 54% (MoWR 2009b) which equates to over 37 million people. This estimate assumes a fixed number of people for each type of technology. A shallow drilled well with a handpump in a rural area is assumed to serve a maximum of 500 people within a radius of 1.5 km with 15 litres/person/day of water. The number of people assumed to be served by protected springs and protected dug wells is lower. MoWR (2008) states that non-functioning water supply schemes are 27-30%. However, more accurate data should emerge from the national WASH inventory that is to be rolled out in 2010.

Data from national household surveys reflects the number of people actually using protected sources. It may thus be a more realistic reflection of the situation than estimates based on an assumed number of users per facility. The JMP publishes data based on Demographic Health Surveys (DHS) and census data. The JMP data indicates that rural coverage went up from 8% in 1990 to 26% in 2008 (WHO/UNICEF 2010). This was an average increase of 1% per annum from 1990. The MoWR (2009b) states that current rates of increase are nearer 6.5% at present, having sped up considerably over the last five years. In terms of sheer numbers, the increases achieved in Ethiopia are greater than for any other Sub-Saharan country, but the task ahead is still enormous.

The Government has prepared a Universal Access Plan(UAP) with a target of 66% of rural people served by improved water by 2010 and 98% by 2012 (MoWR 2008). In order to achieve this, services are required for an additional 8.3 million people per year.

In the past, the government strategy has been to plan the provision of rural water supplies based on hand-dug wells and boreholes equipped with handpumps. These were constructed under government contract and managed by the communities themselves. More recently, lower-cost community hand-dug wells, household level supplies and protected springs have been introduced to the Government strategy, as part of the Universal Access Plan (MoWR 2009).

Fully-protected hand-dug wells are now constructed in two ways:

- In one option, the community digs to the water table (e.g. Figure 2). The community provides labour as well materials for a contractor to dig and line the well below the water table, complete the headworks and install the pump.
- The other option (which is mainly for larger communities) continues the tradition of full excavation and construction by a contractor. For this option, communities pay a higher contribution.

Figure 2: Community Constructs a Hand Dug Well

In 2008, a study to re-formulate the Ethiopian strategies and plans for accelerating access to water (MoWR 2008) identified hesitation to include low-cost options by Regional Governments as a major constraint to progress. This study put more emphasis on household and community investment and lower-cost options. This emphasis is linked to incremental improvements in water supplies up a technology ladder.

The Potential for Accelerating Self Supply

The 2005 Demographic Health Survey (DHS 2005) shows that the majority of rural people use protected springs and surface water (68%), with only 10% using protected or unprotected wells. However, since 2005, and following on from a campaign for self-help construction of irrigation ponds, the government has increased well-digging capacity and has undertaken a major campaign to encourage households to dig or contract others to dig their wells.

In Oromia region alone (population 23 million) families are said to have dug almost 90,000 wells in the three-year period from 2004-6 (Mekassa 2006). However it has been noted that not all of these may have been successful.

In 2007, a brief study to assess the potential for Self Supply in three Woredas in Oromia was undertaken with the regional Water Resources Bureau (Sutton 2007). It found that there were considerable areas with a high density of family wells and a trend in further construction. Even where groundwater potential was low, people wished to invest in wells to have a supply close to their home. Some people were keen to dig their own well, which they could use for both domestic and productive purposes (e.g. Box 1).

Box 1: Attitudes towards family wells and their construction (Source: Sutton, 2007)

"I cannot grow vegetables or water my animals from the community well, but here I can do both". (Man with own well within 80m of community well, Badesa Kalo)

"I cannot take water freely from my neighbour; sometimes they are not happy to see me." (Lady in household where new well being dug, Ilu, Teji)

"I can now water ten cattle in the time it took me to water one." Rope pump owner, Tulobolo

"I have done as far as I can with my knowledge, now I need advice." Man who has dug own well and protected it, but has no lifting device. Jigdu Meda

The strength of the desire to have a supply over which one has personal control is manifest by the number of people who have dug or are planning to dig their own well. Even water sources which only provide a supply for part of the year are regarded as valuable, as they reduce time and effort in the season when most time is needed for work in the fields.

Pride in ownership is also shown through wishes to further upgrade systems. A well is a visible sign of wealth and initiative as well as an asset. People seek to find ways to protect the supply, and to add water lifting devices such as pulleys, and increasingly also rope and washer pumps. The drivers for *Self Supply*¹ are apparent, private sector involvement is growing (both in well-digging and rope and washer pump production), and government policy is favourable. Accelerating the process of Self Supply therefore appears to be feasible.

Overview of Self Supply Initiatives

The main actors are the Ministry of Water Resources (MoWR) and the regional bureaux. MoWR is leading the way in the re-assessment of the Universal Access Plan and development of the 2nd Plan for the Accelerated and Sustained Development to End Poverty (PASDEP) - 2011-2015, and also in moves for greater inclusion of household investments. Certain regions, particularly Oromia, are training their staff to provide advice to households on technical options suitable for Self Supply, and to train artisans in better well construction.

The Water and Sanitation Programme (WSP), UNICEF and RWSN are assisting the Federal Government and Regional Governments² in Ethiopia to accelerate Self Supply as a significant element of efforts to reach the Universal Access Plan targets and those now being developed within the 2nd PASDEP.

WSP and UNICEF have been facilitating the process for greater inclusion of Self Supply by funding national and regional debates on the subject in order to raise awareness of the issues and the potential of Self Supply. UNICEF plans to pilot aspects

¹ See definition on page 2.

² In Ethiopia, many of the regions are equal to or greater in population than the total population of other African countries (apart from DRC and Nigeria), and the regions are largely autonomous. Thus, initiatives need to be undertaken both at federal level and in specific regions.

of Self Supply in four Woredas and is preparing to undertake a study to establish what technology levels might be counted as 'coverage' and to assess the risk levels associated with different options. UNICEF is also supporting a mapping of locations where Self Supply may be feasible in Ethiopia. WSP has been funding the coordination of the Self Supply Flagship within RWSN, including inputs in Ethiopia.

Japanese International Cooperation Agency (JICA) has also been very involved in the introduction of the rope and washer pump, and in private sector strengthening and quality control for its manufacture. Production started in Addis but is now spreading out to the regions.

The role of RWSN has been to:

- Raise awareness of the potential for Self Supply in Ethiopia.
- Provide technical support to MoWR, WSP and UNICEF.
- Ensure international promotion of the findings and wider debate.

Approach Taken in Ethiopia

In Ethiopia, the Government process for accelerating Self Supply has taken a rather different course from the other three countries (Mali, Uganda and Zambia). Whereas in the latter countries, the starting point has been the testing of the approach (including promotion) and of suitable technologies before any major policy shift, this is not entirely the case in Ethiopia. However, it is important to note that in Oromia Region, the use of family wells is already very common.

The Government has been considering lower cost options for community level water supplies for some time. Key members of the federal MoWR had shown interest in the concept of Self Supply as far back as the RWSN Durban Forum in 2003 and again at the 2006 Ghana Forum. The well-digging campaign launched in 2005 has been building on the demand for household level solutions. However its impact has yet to be monitored and strategic lessons still need to be learnt from this. The Self Supply reconnaissance report (Sutton 2007) illustrated the range of responses that people were already making to their own needs for better water supplies. The report also highlighted the continued demand for incremental improvements to access (i.e. shorter distance and easier water lifting) and water quality.

Partly in response to the 2007 Self Supply report, the MoWR commissioned a study in 2008 to look at the re-formulation of the Universal Access Plan with a view to including low-cost options at household level in a significant way (MoWR 2008). This study explored the scope for Self Supply in different regions and looked at the lower levels of decision-making, from Kebele to community to household. These had not been included in the original Universal Access Plan.

A national level consultative workshop was held in Wolisso in June 2008. It was attended by MoWR, WASH and health officers from most regions as well as DFID, WSP, UNICEF, WaterAid and the consultants undertaking the study (MoWR/UNICEF/WSP 2008). The study examined how to incorporate Self Supply into the Universal Access Plan. The experiences of Zambia and other countries were also presented. The workshop was an important

opportunity to develop a strategy for greater adoption of the Self Supply concept in Ethiopia (Box 2).

Whilst the re-formulated Universal Access Plan proposes more emphasis on low-cost options and user investment, it has yet to be implemented. Models for going to scale with accelerated self supply are being developed by government, but policies with respect to subsidy have yet to be formulated.

Box 2: Outputs - 2008 Consultative Workshop on Self Supply (Source: MoWR/UNICEF/WSP 2008)

Self Supply will form an integral part of the Universal Access Plan implementation strategy for the longer term and should not be regarded as an interim solution (MoWR, 2008).

Steps in the ladder of service improvement need to be linked to water safety, and the lowest acceptable step to count as 'coverage' should be defined within Universal Access Plan and Millennium Development Goal (MDG) targets. This should also be linked with recognition of the role of hygiene and water collection behaviour.

It is important that sector professionals and local political leaders are aware of the benefits of Self Supply and the valuable role of lower steps to allow affordable achievement of higher service levels.

Donor and government investment should play a key role in 'soft' components of an enabling environment, such as training, advisory services, introduction and development of new technologies, microfinance and advocacy. This also contributes to lower unit costs, except in cases where no low-cost option is feasible.

Household water treatment and safe storage need wider promotion to offer security of safe water but should not be obligatory for acceptance of Self Supply.

Household water treatment and safe storage promotion and hygiene education will also be linked to sanitary surveillance to identify risk factors and their remedial actions.

Technology Promotion in Oromia Region

The technologies promoted in Oromia region relate mainly to well-head stabilisation, but also to well lining and water lifting devices. Well-head stabilisation is especially necessary in the black cotton soils, which collapse easily at the surface.

It is only since 2005 that people have begun to avoid replacing wells annually by introducing a top lining which prevents collapse. This lining generally consists of a wooden platform with sacking, plastic or mud and straw to reduce surface water infiltration, and a clay apron and open-ended container to direct spilt water away from the well mouth (see Figure 3).

Well-diggers in Ethiopia can dig very small diameter wells (0.6m minimum) as shown in Figure 4, which can be lined with road culvert pipes. Wood and steel barrels can be used for lining around the well mouth.

Oromia Water Resources Bureau train their district and water resource officers in well construction and use the principles

from this to illustrate the types of improvements people can make to existing traditional wells. District officers provide advice to households on the different levels of protection. Much emphasis is on the digging of new wells, and skilled well-diggers are much in demand.

Figure 3: Traditional Well - Protected and Stabilised



Water-lifting is usually directly by hand or by a pulley. Some people have developed the double pulley for deeper wells (one bucket goes down as the other comes up).

JICA have been introducing the rope and washer pump (Figure 5) with local manufacture, initially in Addis Ababa but now also in some regional centres and Woreda towns. These rope pumps are aimed almost exclusively at household level and have been installed at the well-owner's cost, with credit for six months. Government is now also buying the rope pumps. This implies that subsidies may be introduced which may influence the market dynamics that have been developing. A few well-owners are aiming at higher levels of service such as submersible pumps.

Figure 4: Small Diameter Well-Digging in Ilu Woreda



There is a move to introduce household water filters (e.g. their manufacture and marketing from Selam TVC). Population Services International (PSI) are also marketing household chlorination products. However, the build-up of demand has been inter-

rupted by free distribution of chlorine products during recent epidemics of cholera or acute watery diarrhoea.

Capacity Building in Oromia Region

In Oromia region, the regional Water Resources Bureau has been working hard to promote lower-cost options and prepare extension staff and local administration for the new orientation of the reformulated strategies for implementing the Universal Access Plan. They have been particularly active in:

- The preparation of manuals and guidelines to facilitate and accelerate implementation of family wells (Mekonta & Gutema 2008).
- Training of local communities, especially development agents and local artisans.
- Conducting regular supervision to closely follow-up the progress of implementation.
- Introducing more innovative water lifting techniques. This includes a rope pump pilot project funded by JICA.
- Undertaking advocacy and promotion activities including dissemination of Information, Education and Communication (IEC) materials in the local language.

Policy and Strategy Development

To accelerate implementation of the Universal Access Plan, the original strategy was reformulated (MoWR 2008) to include the following statements:

- Focus should firstly be given to household and community level low-cost technologies (groundwater and rainwater) which could be constructed or upgraded by significant contribution of the water-users.
- If this level of technology is not suitable, then second priority will be given to water supplies implemented in 'business as usual' methods, which are labour-intensive and use maximum local materials. The technologies include hand-dug wells fitted with rope pump/handpump, protected springs, roofwater harvesting, ponds and cisterns. Beneficiaries shall be required to pay a percentage of the construction cost in addition to their contribution in kind through labour and local construction materials.
- Finally, high-cost technologies shall be an option only if low-cost technologies are not feasible and the beneficiaries are willing to share a percentage of the cost.
- Cost-sharing principles should be implemented by everyone, including NGOs, to avoid damaging the willingness of communities to share costs.
- Community-level WASHCOs will be responsible for Universal Access Plan implementation at community level. Each household is responsible for the implementation of his own household low-cost technology.
- Upgrading of traditional household and community level water sources shall take place step by step according to the capacity of the beneficiaries so as to be completed in a few years.

- Upgrading of household-level technologies for multiple use purpose which can earn the family economic benefit shall be highly encouraged.

The new strategy states that to count as 'coverage' a hand-dug well should be at least: partially lined in stone, concrete or any other durable material not affecting water quality for the top few metres; have a raised well-head with apron and drainage facilities and a man-hole cover. It should be well-protected from sanitary risk. It is preferable to have a handpump/rope pump installed. However, for a household or a few households, windlasses from durable materials, pulleys and other lifting devices which have no sanitary risk should be utilised.

Figure 5: Rope Pump for Domestic and Irrigation Use



Synthesis of Key Issues

Technical issues

Guidelines and monitoring: Few low-cost technology options have been tested or demonstrated. Some lower-cost solutions are being practised, but manuals and guidelines still only tend to include the conventional options. Additional simplified guidelines on incremental cost-saving measures might help those unfamiliar with simpler, lower-cost designs and could form a useful basis for giving advice to communities and households as well as for costing and marketing new ideas.

To produce such guidelines, lessons are required from the assessment of the performance of different technical options, affordability and user satisfaction. At present, such information is lacking. The Rapid Water Quality Assessment (MoH et al 2006), for example, only covers conventional community water supply technologies. A benchmarking survey is planned in Oromia.

Planning issues

Regional experience: Examples of accelerated Self Supply are more widely available in some regions than others. Where there is little experience, up-take of the idea is slow. Given that each region is autonomous and wants to build its own experience and methods, exchange visits and piloting may be helpful. Despite the Federal Government's request for each region to concentrate more on low-cost options, most of the reformulated

regional Universal Access Plan plans still appears to reflect a 'business as usual' approach.

While government would like to make a mass campaign on what people can do for themselves, it is difficult to go to scale without any intermediate steps. This applies particularly to financial mechanisms and technologies, i.e. to find out what is most acceptable in different situations, and to enable sector professionals to see their advantages.

Social and financial issues

Subsidies and beneficiaries: The re-formulated strategy acknowledges that a household supply (i.e. privately owned by individual/family) often provides water for others in the community. Benefits may therefore be to more than just the owners and their families. As such it is not known yet what, if any, level of subsidy will be available to those who want to improve their own supply, and whether it would be linked to how much the supply is shared. Striking the balance between enabling and demotivating with subsidies is very difficult and varies significantly from family to family and place to place.

Sources of Funding: Rural Ethiopian society has several traditional methods of saving money in community schemes and social safety nets. Little is known as to whether these would be flexible enough to embrace investment in water supplies for communities or individuals. Certainly some have been used to provide funds temporarily for communities to pay labour to bring materials and dig wells. Greater understanding of these systems and use of their management capacities to control revolving funds plus expansion of rural credit schemes to cover water supply investments may help accelerate supply improvements. Modification of the Community Development Fund concept for household investment is also a possible approach but is likely to require a move from grants to loans (Finnish Embassy 2009).

Conclusion

Ethiopia is one of the countries in sub-Saharan Africa which was earliest to begin to adopt Self Supply principles. The official inclusion of some of these principles into the re-formulated strategy for implementing the Universal Access Plan is a major step forward and an example for other countries to explore.

The enormous scale at which results may be achieved is both an opportunity and a challenge. Moving from policy and strategy to implementation is a big step. Not all previous national campaigns have been successful, and there is a danger in moving into large-scale implementation without piloting some of the less well-developed elements (e.g. finance, credit, marketing, promotion and private sector development beyond artisan levels) first. Collecting more information on what exists, to understand the dynamics of existing private initiatives, as well as trying out a few options in the field and monitoring results may prove a valuable investment in time and resources to ensure effective 'going to scale'.

With the time constraints to achieve targets, it is perhaps unlikely that much piloting will be possible. Therefore, monitoring of response and procedures from the start of a campaign will be essential, so that any necessary adjustments can be made as momentum builds up.

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Dr. Sally Sutton coordinates the RWSN Self Supply Flagship. She has more than 30 years of experience in rural water supply, including practical hydrogeology, planning, evaluation, systems and policy development. A major interest is in helping to bridge the gaps which often exist between end-users and policy-makers so that consumers have informed access to a wider range of options which reflect their concerns and values.

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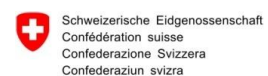
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